# PATENT SPECIFICATION

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## (54) FLUID PRESSURE RETAINING SEALS FOR HIGH TEMPERATURE JOINTS


(71) We, JOSEPH LUCAS (INDUSTRIES) LIMITED, of Great King Street, Birmingham 19, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—


This invention relates to fluid pressure retaining seals for use in high temperature joints.

It has been proposed to make use of a so-called E-ring, which consists of a complete ring formed of thin resilient metal. The ring is basically of channel shaped cross-sectional configuration with the web of the channel inwardly indented and with axially outwardly directed lips on the sides of the channel respectively. It is the intention that a ring of this sort should be 'self-energising', i.e., that the fluid pressure should enter the channel and thrust the lips thereof more firmly into engagement with the parts to be joined.

It has been found, however, that such self-energisation does not occur in situations where the ring is disposed in a groove with the web of the channel abutted against the base of the groove. In these circumstances there are two areas of contact between the web of the channel and the base of the groove so that fluid pressure acting upon the web of the channel intermediate these two contact areas tends to cause flattening of the indentation, which in turn causes inward displacement of the lips, contrary to the expectation that pressure will cause the lips to move outwardly.

It is an object of the invention to provide a seal of the E-ring type in which this disadvantage is avoided.

In accordance with the invention there is provided a seal comprising the combination of an E-ring of the kind described, with a ring of metal wire in the indentation in the web of the channel of the E-ring, the cross-sectional dimension of the ring in the plane of the depth of the indentation being greater than the said depth.

An example of the invention is shown in the accompanying drawing, which is a fragmentary cross-section through a joint including a seal in accordance with the invention.

The seal comprises the combination of a thin resilient metal E-ring 10 of basically channel-shaped cross-sectional configuration, the web of the channel having an indentation 11 and the sides of the channel having outwardly directed lips 12, with a metal wire ring 13 in the indentation 12 and of cross-sectional diameter greater than the depth of this indentation.

As shown the wire bears against the base of the groove formed between the two parts 14, 15 to be joined so that fluid pressure acting on the web of the channel tends to move the edges of the web towards the base of the groove thereby increasing the effect of fluid pressure on the sides of the channel to urge the lips 12 into sealing contact with the parts 14, 15 respectively.

WHAT WE CLAIM IS:—

1. A seal comprising the combination of an E-ring of the kind described with a ring of metal wire in the indentation in the web of the channel of the E-ring, the cross-sectional dimension of the ring in the plane of the depth of the indentation being greater than the said depth.

2. A seal substantially as previously described with reference to and as shown in the accompanying drawing.

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1 SHEET *This drawing is a reproduction of the Original on a reduced scale*